

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1–25. (canceled)

26. (currently amended) An anisotropic scintillator for use in an imaging system comprising:

 a scintillator element comprised of a an isotropic scintillator material having a first optical property;

 a three-dimensional pattern formed in said scintillator element utilizing a pulse laser, said pulse laser altering said first optical property at a plurality of discrete locations in said scintillator element such that said three-dimensional pattern is comprised of ~~scintillator material having a complex~~ anisotropic portions and such that said three-dimensional pattern forms anisotropic portions form localized channel regions in said scintillator element;

 wherein said three-dimensional pattern-and-said-complex-anisotropic-portions-are together is configured to control the spread of photons to achieve desired signal sharing among the plurality of regions having borders defined by the plurality of discrete locations-within-said-scintillator-element; and

 further wherein said-complex anisotropic portions-and-said three-dimensional pattern are together configured via comprised of at least one optical property selected from of a plurality of optical properties to preserve spatial information allowing reliable centroid determination within the anisotropic scintillator.

27. (original) An anisotropic scintillator for use in an imaging system as described in claim 26, wherein said three-dimensional pattern comprises:

a plurality of first parallel planes formed across said scintillator element; and
a plurality of second parallel planes formed across said scintillator element perpendicular to said plurality of first parallel planes, said plurality of second parallel planes intersecting said plurality of first parallel planes to form a plurality of scintillator cells.

28. (original) An anisotropic scintillator for use in an imaging system as described in claim 26, wherein said scintillator element comprises a single crystal element.

29. (original) An anisotropic scintillator for use in an imaging system as described in claim 26, wherein said scintillator element comprises a ceramic element.

30. (previously presented) An anisotropic scintillator for use in an imaging system as described in claim 26, wherein said first optical property of said scintillator element is converted to a second optical property without removing material from said scintillator element.

31. (previously presented) An anisotropic scintillator for use in an imaging system as described in claim 26, wherein said first optical property of said scintillator element is converted to a second optical property without adding material to said scintillator element.

33. (canceled)